

<b>SBMS</b>	Forms	Contact List	SBMS Instructions	Help Desk
-------------	-------	--------------	-------------------	-----------

**Find Subject Areas:** Index Categories Alpha

**Show Side Menu** Search Subject Areas & Legacy Documents:

Subject Area: **Radioactive Airborne Emissions**

**Contents: Radioactive Airborne Emissions**

Effective Date: **March 1999**

Point of Contact: [Environmental Compliance Representative](#)

## Section

## Overview of Content (see section for full process)

### [Introduction](#)

#### [1. Notification Requirements for Radioactive Emissions](#)

- Determine if activity must be reviewed by the ESD.
- Do not proceed any further if review is not required.
- Supply information indicated in NESHAPs Assessment Form and submit to ESD.
- Perform evaluation of emissions source and determine if monitoring or permitting is required.
- Proceed with work upon receiving documented evaluation from the ESD.
- Proceed with work when equipment is installed and operational in the event monitoring is required.

#### [2. Monitoring Radioactive Airborne Emissions](#)

- Select an effluent sampling site.
- Conduct effluent flow rate measurements.
- Measure and quantify radionuclide releases.
- Identify and measure all radionuclides that could contribute at least 10% of the potential effective dose equivalent for the effluent source.
- Implement a QA program for the monitoring system.

### [Definitions](#)

### **Exhibits**

[Emissions Monitoring Criteria](#)

[NESHAPs Assessment Form](#)

[Radioactive Airborne Emission Evaluation Process](#)

### **Forms**

None

## Training Requirements and Reporting Obligations

This subject area does not contain training requirements.

This subject area may or may not contain reporting obligations. See the subject area until obligations are listed here.

## References

ANSI/N13.1-1999, "Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities."

## Standards of Performance

All staff and guests shall comply with applicable Laboratory policies, standards, and procedures, unless a formal variance is obtained.

All staff and guests shall promptly report accidents, injuries, ES&H deficiencies, emergencies, and off-normal events in accordance with procedures.

Managers shall analyze work for hazards, authorize work to proceed, and ensure that work is performed within established controls.

Managers shall ensure that work is planned to prevent pollution, minimize waste, and conserve resources, and that work is conducted in a cost-effective manner that eliminates or minimizes environmental impact.

Before waste is generated, managers shall ensure that it has a funded and available disposition pathway. Managers shall ensure that all hazardous materials and waste have an identified owner who is accountable for its proper disposition.

All staff and users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that protects the environment and the public.

All staff and users shall ensure that environmental effluents, emissions, and wastes associated with their work are as low as reasonably achievable (also referred to as "E-ALARA").

## Management System

This subject area belongs to the management system.

1.1-071999/standard/0b/0b00t011.htm

Send a question or comment to the [SBMS Help Desk](#)  
[Disclaimer](#)

<b>SBMS</b>	Forms	Contact List	SBMS Instructions	Help Desk
-------------	-------	--------------	-------------------	-----------

**Find Subject Areas:** Index Categories Alpha

**Show Side Menu** Search Subject Areas & Legacy Documents:

Subject Area: **Radioactive Airborne Emissions**

### Introduction: Radioactive Airborne Emissions

Effective Date: **March 1999**

Point of Contact: [Environmental Compliance Representative](#)

The National Emission Standards for Hazardous Air Pollutants (NESHAPs), a subpart of the federal Clean Air Act (CAA), regulates the release of airborne radioactive materials to the environment. This regulation establishes permitting, monitoring, reporting, and public dose limit requirements for air emission sources. The NESHAPs regulations are administered and enforced by the U.S. Environmental Protection Agency. Under NESHAPs, the Laboratory must demonstrate on an annual basis that no member of the public has received a radiological dose greater than 10 mrem from Laboratory air emissions. All Laboratory sources of airborne radioactive material must be identified and assessed, regardless of the quantity involved. Examples of sources that must be identified and assessed include point sources such as reactor stacks, diffuse sources such as liquid holding ponds, and bench-top radioisotope work conducted in ventilation hoods.

This subject area identifies the procedures for informing the Environmental Services Division of new sources of radioactive airborne emissions, and of planned modifications to existing sources that may result in emission increases or changes in the radionuclides released. Emission source owner and operator responsibilities for meeting applicable regulatory requirements are defined. Adherence to these procedures and guidelines will ensure that all sources of radioactive airborne emissions from the Laboratory meet federal requirements.

**The only official copy of this file is the one online in SBMS. Before using a printed copy, verify that it is the most current version by checking the document effective date on the BNL SBMS website.**

1.0-061999/standard/0b/0b00i011.htm

Send a question or comment to the [SBMS Help Desk](#)  
[Disclaimer](#)

<b>SBMS</b>	Forms	Contact List	SBMS Instructions	Help Desk
-------------	-------	--------------	-------------------	-----------

Find Subject Areas: Index Categories Alpha

Show Side Menu Search Subject Areas & Legacy Documents:

Subject Area: **Radioactive Airborne Emissions**

## 1. Notification Requirements for Radioactive Airborne Emissions

Effective Date: **March 1999**

Point of Contact: [Environmental Compliance Representative](#)

## Applicability

This section applies to Line Managers who are responsible for projects, activities, and/or facility modifications that might create, increase, or change radioactive airborne emissions or their control systems.

## Required Procedure

Follow the procedure below to determine if your activity must be reviewed by the Environmental Services Division.

<b>Step 1</b>	<p>Is the proposed activity any of the following?</p> <ul style="list-style-type: none"> <li>• a new project involving radioactive material that includes the completion of an Experimental Design Review;</li> <li>• a project that changed from its original scope thereby affecting radioactive airborne emissions;</li> <li>• the addition of new equipment utilizing radioactive material that requires ventilation to the atmosphere;</li> <li>• the first-time use of a new type or increased amount of an existing radioactive material in a facility;</li> <li>• the addition, replacement, or modification of a facility or system that affects ventilation systems handling radioactive material;</li> <li>• decontamination and/or decommissioning of a nuclear facility.</li> </ul>
<b>Step 2</b>	<p>If none of the above apply, notification is not required and the remaining steps of this subject area do not apply.</p> <p><b>Note: concurrence from your Environmental Compliance Representative is strongly recommended.</b></p> <p>If any of the above apply to your proposed activity, supply the information indicated in the <a href="#">NESHAPs Assessment Form</a> and submit it to the Environmental Services Division for review. Your Environmental Compliance Representative is available to assist you in completing the form.</p>
<b>Step 3</b>	<p>The Environmental Services Division performs an evaluation of the emissions source and determines whether monitoring or permitting is required. The level of monitoring required will be determined according to the criteria contained in the <a href="#">Emissions Monitoring Criteria</a> exhibit. If ESD determines that the public dose potential for the proposed activity is greater than or equal to 0.1 mrem/year, ESD files a Permit for Construction/Modification with the Environmental Protection Agency.</p>

	Agency.
<b>Step 4</b>	Proceed with work when you receive the documented evaluation from the Environmental Services Division. If the evaluation indicates that monitoring is required, work may proceed only after the necessary equipment is installed and operational. See the <a href="#">Monitoring Airborne Radioactive Emissions</a> section for operational monitoring requirements.

## Guidelines

Begin the notification process as early as possible to allow time for completion of the review. If the review determines that a federal permit or dedicated monitoring is required, obtainment of the permit or the installation of equipment may delay the start of the activity.

Maintain a record of the Environmental Service Division's formal evaluation of the emissions-generating activity for future reference.

The Environmental Subject Matter Expert (SME) can provide information on appropriate instrumentation and internal service providers. Contact the SME for an estimation of resource needs.

| [Continue to Next Page](#) |

**The only official copy of this file is the one online in SBMS. Before using a printed copy, verify that it is the most current version by checking the document effective date on the BNL SBMS website.**

1.0-061999/standard/0b/0b01d011.htm

Send a question or comment to the [SBMS Help Desk](#)  
[Disclaimer](#)

<b>SBMS</b>	Forms	Contact List	SBMS Instructions	Help Desk
Find Subject Areas: Index Categories Alpha				
Show Side Menu	Search Subject Areas & Legacy Documents:			

Subject Area: **Radioactive Airborne Emissions**

## 2. Monitoring Airborne Radioactive Emissions

Effective Date: **March, 1999**

Point of Contact: [Environmental Compliance Representative](#)

## Applicability

This section applies to Line Managers who are responsible for projects or activities generating radioactive airborne emissions that have been identified as requiring monitoring.

## Required Procedure

Radioactive airborne emissions monitoring shall be conducted using the following procedure. **Departments creating radioactive air effluents that require monitoring are ultimately responsible for guaranteeing that this procedure is implemented.** Departments are encouraged to contact the Environmental Services Division, the Radiological Controls Division or other groups for support in the implementation of this procedure.

**Note:** Environmental Compliance Representatives (ECRs) have access to all of the references contained in this procedure; they are available to interpret the requirements contained within the regulations and provide guidance regarding proper implementation.

<b>Step 1</b>	Select an effluent sampling site in accordance with 40 CFR 60, Appendix A, Reference Method 1.
<b>Step 2</b>	Conduct effluent flow rate measurements in accordance with 40 CFR 60, Appendix A, Reference Method 2. The frequency of such measurements depends up on the variability of the flow rate. For constant flow rates, periodic measurements are sufficient; for variable flows, more frequent measurements are necessary.
<b>Step 3</b>	Measure and quantify radionuclide releases using the methods established in 40 CFR 61, Appendix B, Method 114.
<b>Step 4</b>	Identify and measure all radionuclides that could contribute at least 10 percent of the potential effective dose equivalent for the effluent source.
<b>Step 5</b>	<p>Implement a quality assurance program for the monitoring system in accordance with the performance requirements described in 40 CFR 61, Appendix B, Method 114.</p> <p>The responsibilities for the various required Quality Assurance (QA) elements of 40 CFR 61, Subpart H in most cases will be shared among the department producing the air emissions (DEPT), the Analytical Services Laboratory (ASL), the Radiological Controls Division (RCD) and the Environmental Services Division (ESD). The following list of QA elements indicates a typical division of responsibilities. (The actual division of responsibilities will be determined on a case by case basis, depending on the type of monitoring being performed.)</p> <p>a. Documented organizational structure related to emissions measurements - DEPT</p>

- b. Administrative controls to ensure that an increase in emission rates due to unplanned operations will receive a prompt response - DEPT
- c. Documented sample collection and analysis procedures - organization that collects the samples is responsible.
- d. Description of sampling sites, sampling probes, and continuous monitoring system, including sensitivity, calibration procedure and calibration frequency - DEPT / RCD
- e. Description of sample collection system - DEPT / RCD
- f. Description of laboratory analysis procedures for each radionuclide measured - ASL
- g. Description of sample flow rate measurement systems or procedures including calibration procedure and calibration frequency - DEPT / RCD
- h. Description of effluent flow rate measurement systems or procedures, including calibration procedure and calibration frequency - DEPT / RCD
- i. Stated data quality objectives specifying required precision, accuracy and completeness - DEPT / ESD
- j. Analytical Quality Control program, including control charts, spikes, duplicates, etc.- ASL
- k. Sample tracking system - ASL
- l. Periodic audits of the QA program - DEPT
- m. Corrective action program - DEPT
- n. Documented Quality Assurance Program Plan - DEPT

## Guidelines

When selecting equipment to be used for effluent sampling/monitoring, consult the Radiological Controls Division Instrumentation Group. The Instrumentation Group will provide feedback on the acceptability of the proposed equipment and advise you regarding the availability of system installation and maintenance support.

Compare effluent monitoring system designs against the guidance of ANSI/N13.1-1999, "Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities." This guidance, though not yet officially adopted by the EPA, contains state of the art design information.

## References

ANSI/N13.1-1999, "Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities."

| [Go to Previous Page](#) |

**The only official copy of this file is the one online in SBMS. Before using a printed copy, verify that it is the most current version by checking the document effective date on the BNL SBMS website.**

1.0-061999/standard/0b/0b02d011.htm

## Emissions Monitoring Criteria

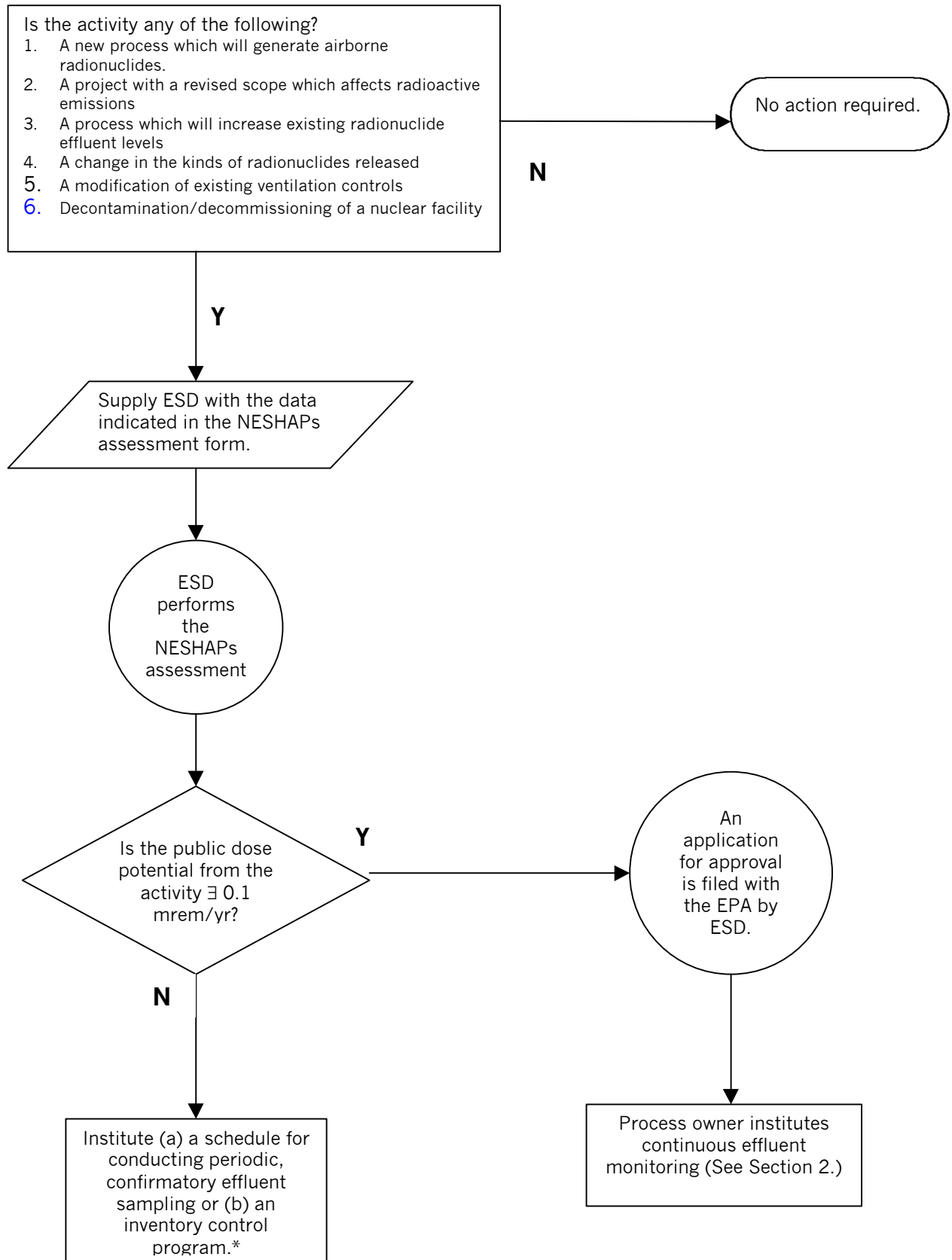
Calculated Effective Dose Equivalent ( $H_e$ ) to a Member of the Public, mrem/yr	Required Monitoring
$H_e \geq 0.1$	<ol style="list-style-type: none"><li>1. Continuously monitor emissions</li><li>2. Identify radionuclides contributing <math>\geq 10\%</math> of the dose</li></ol>
$H_e < 0.1$	<ol style="list-style-type: none"><li>1. Conduct periodic, confirmatory measurements to verify low emissions. (Note: inventory records may be used to satisfy this requirement in some cases.)</li></ol>

## NESHAPs Assessment Form


This form lists the information necessary for the Environmental Services Division to perform a NESHAPs compliance assessment for operations that could cause, increase or change the composition of airborne radionuclide emissions.

1. Location of potential source (building and room)
2. Description of the process that generates airborne radionuclides
3. Description of the emissions controls in place (e.g., HEPA, charcoal filters, etc.)
4. List of the radionuclides that will be used or generated
5. Estimates of the quantities of radionuclides that will be used or generated
6. Restrictions on facility operations (e.g., operating for only 3 months per year)
7. Description of the air handling device, including: a. stack height (above ground level)  b. stack diameter at exit point  c. exit velocity of air effluent  d. temperature of air effluent at exit point

## Radioactive Airborne Emission Evaluation Process



\* ECR or ESD should be consulted to determine which is appropriate.



[Forms](#) [Contact List](#) [SBMS Instructions](#) [Help Desk](#)

**Find Subject Areas:**

[Show Side Menu](#) **Search Subject Areas & Legacy Documents:**

Subject Area: **Radioactive Airborne Emissions**

### Definitions: Radioactive Airborne Emissions

Effective Date: **March 1999**

Point of Contact: [Environmental Compliance Representative](#)

Term	Definition
airborne emission/ effluent	Air contaminants or pollutants emitted from a facility, process, activity, or source.
diffuse source	A radionuclide emissions source in which the emissions are either continuously distributed over a given area or emanate from a number of points randomly distributed over the area. Examples include resuspended dust deposited on open fields and evaporation from ponds. Synonymous with area source.
effluent monitoring	The characterization and measurement of airborne effluents used to assess radiation exposure to the public and demonstrate compliance with applicable regulations.
facility modification	Any physical change in a source that could increase the amount of radionuclides emitted by the source or that results in the emission of any radionuclide not previously emitted.
NESHAPs	National Emission Standards for Hazardous Air Pollutants. Subpart of the federal Clean Air Act regulating airborne radionuclide emissions.
point source	A discrete point of environmental release for airborne radionuclides, typically stacks or vents.
source	Origination point for the environmental release of airborne radionuclides.

[Back to Top](#)

**The only official copy of this file is the one online in SBMS. Before using a printed copy, verify that it is the most current version by checking the document effective date on the BNL SBMS website.**

1.0-061999/standard/0b/0b001011.htm

Send a question or comment to the [SBMS Help Desk](#)

[Disclaimer](#)

<b>SBMS</b>	Forms	Contact List	SBMS Instructions	Help Desk
-------------	-------	--------------	-------------------	-----------

**Find Subject Areas:** Index Categories Alpha

**Show Side Menu** Search Subject Areas & Legacy Documents:

Subject Area: **Radioactive Airborne Emissions**

Revision History: Radioactive Airborne Emissions

Point of Contact: [Environmental Compliance Representative](#)

## Revision History of this Subject Area

Date	Description	Management System
March 1999	This subject area replaces ES&H Standard and SEAPPM 6.1.4.	Environmental Management System

**The only official copy of this file is the one online in SBMS. Before using a printed copy, verify that it is the most current version by checking the document effective date on the BNL SBMS website.**

1.0-061999/standard/0b/0b00a011.htm

Send a question or comment to the [SBMS Help Desk](#)  
[Disclaimer](#)